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12
POWER PROSPECTUS.

VOTE

AND USE YOUR INFLUENCE
TO MAKE

WINNIPEG

A

MANUFACTURING
CENTRE.

*Printed for Circulation by
order of the City Council.*

Facts for the Electors.

While the growth of Winnipeg will be large in any case, nothing will contribute so much to the increase of population and land values as the establishment of industries employing large numbers of operatives.

There are two prime necessities for Manufacturing—

- (1) A Market.
- (2) Low cost power.

The West is developing into one of the most valuable markets in the world.

Power can be delivered in Winnipeg at prices which compare favorably with those of Eastern Cities.

The lower the cost of power, the greater the inducement to manufacturing activity.

Therefore, it is of the first importance that the power should be really cheap. In fact, that it should be supplied to users at bare cost.

The only means by which power can be supplied at bare cost is by the construction of the necessary works by the people as a whole—and not by a private company—which could not be expected to sell at cost.

The people as a whole will benefit by the increase in values and the greatly enlarged field for business and employment.

The people as a whole can borrow money on more favorable terms than a company—can construct the works as cheaply; and do not require a surplus revenue to pay dividends.

All proposals received by the City from Companies require a contract or guarantee from the City to furnish sufficient revenue to enable them to float bonds.

Why should the City not use its credit for its own benefit?

What the revenue required by a Company would amount to, in excess of that needed by the City, may be seen by referring to the table of comparative rates page.

From which it appears, using the same amount of power, that the revenue required by the Company is \$4,615,000, while that required by the City is \$419,220.

As it is intended that the works of the City shall earn only sufficient to pay charges and running expenses, the low prices given will be further reduced as consumption increases.

The inducement to Manufacturers to establish themselves in business here is in proportion to the lowness of the rates charged for power.

Therefore, the City offers at least 5 times greater inducement than does the Winnipeg Electric Ry. Company in its new rates.

Some of the industries and uses to which CHEAP power may be put are—

- (1) Flour Milling.
- (2) Wood pulp manufacture.
- (3) Woolen Manufacture.
- (4) Commercial and City Lighting.
- (5) General Manufacturing.
- (6) Heating.

Heating and cooking, hitherto done by the direct consumption of fuel or of fuel gas, will, with Electric energy at the proposed price, tax the resources of several of the larger powers on the Winnipeg River. The amount of energy required to heat 20,000 houses at an average consumption of 100 lbs. of coal per day, and assuming that 50 per cent. of the heat is utilized, is equivalent to 230,000 Electric Horse Power. For comparative costs of coal and Electric Heating see appendix page

The large use of power for heating, of course, applies to principally 6 months of the year, but the quantity available in the first development is so small in proportion to the requirements, being only about 3 per cent. that much, if not all, may reasonably be expected to be used for cooking and other purposes.

The surplus power when not required for heating in summer may be also used for illuminated advertisements, at a correspondingly low rate.

It has been stated that the Winnipeg Electric Ry. Co. have made some special contracts at about \$35 per H.P. per annum. The City's corresponding price is \$16.31.

As in the case of the Water Works, the rates will be lowered from time to time as the amount of power used and the revenue increase.

**ESTIMATES OF THE AMOUNTS OF POWER WHICH CAN
BE DISPOSED OF AT THE ABOVE RATES UPON
COMPLETION OF THE WORKS 2½ YEARS
HENCE.**

Elevators	1000	H.P. at	\$130.00.....	\$ 130,000
Motors	2000	"	98.00.....	196,000
"	1000	"	65.00.....	65,000
"	1000	"	49.00.....	49,000
"	2000	"	16.33.....	32,660
Lighting	4000	"	195.00.....	780,000
<hr/>				
11000				
<hr/>				
				\$1,252,660

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Cost per H.P. as estimated	\$18.00
Sinking fund additional....	1.66
Distribution... ..	5.00

17,000 H.P.	at \$24.66... ..	\$ 419,220
-------------	-------------------------	------------

Net Profit.....	\$ 833,440
Add for sales of balance of 17000 not in above schedule to be used for heating—6000 H.P. at \$12.24.	

73,440

\$ 906,880

REVENUE REQUIRED BY WINNIPEG ELECTRIC RAIL- WAY CO. ON BASIS OF THEIR REDUCED RATES AND USE OF 17,000 H.P.

Elevators 1000 H.P. at	\$390.00.....	\$ 390,000
Motors 2000 "	390.00.....	780,000
" 1000 "	260.00.....	260,000
" 1000 "	195.00.....	195,000
" 2000 "	195.00.....	390,000
Lighting 4000 "	650.00.....	2,600,000

Balance 6000 lowest rate 195.00.....	\$4,615,000
	1,170,000

\$5,785,000

CITY OF WINNIPEG.

DEBENTURE DEBT AS AT 1st MAY, 1906.

	Amount.	Sinking Fund in hand.
1. General (including the City's share of Local Improvements, \$626,280.72.....)	\$3,808,527.36	\$290,491.36
2. Property Owners' share of Local Improvements, secured by spec- ial assessment.....	4,074,607.66	774,356.36
3. Water Works.....	1,904,090.34	72,198.86
	<u>\$9,787,225.38</u>	<u>\$1,137,046.58</u>
Includes bonds in hand unsold.		

NOTE:

Gross Debenture Debt includes all debenture upon which the City is directly or indirectly liable.

Deductions from the Gross Debt are debentures issued for revenue producing purposes; debentures issued for the improvement of property upon which they are secured; all sinking funds except those for local improvement debentures.

Gross Debt..... 9,787,225.38

Deduct:

Water Works (Rev.).....	1,904,090.34	
Property Owners' share of Local improvements.....	4,074,607.66	
Sinking Funds other than Local Improvements.....	362,690.22	
		<u>\$6,341,388.22</u>

Net Debt to be provided for by the City at large.....	<u>\$3,445,837.16</u>
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D. S. CURRY,

City Comptroller.

May 3rd, 1906.

Service.	WINNIPEG ELECTRIC RAILWAY COMPANY'S RATES.				CITY PROPOSED RATES.	
	OLD.		NEW.		Per K.W. Hour. Cents.	Per H.P. Year. \$
	Per K.W. Hour. Cents.	Per H.W. Year. \$	Per K.W. Hour. Cents.	Per H.P. Year. \$		
Elevators.....	20	1307	*6	390.00	2	130.00
Motors	12½	817				
" to 50 h.p.			*6	390.00	1½	98.00
" to 100 h.p.			*4	260.00	1	65.33
" over 100 h.p.			*3	195.00	¾	49.00
" 500 to 1000					½	32.66
" over 1000 h.p.					¼	16.33
Lighting.....	20	1307	**10	650.00	3	195.00
Heating and Cooking					3-16	12.24

* Discount 10 per cent. for payment within 10 days,

** Discount 10 per cent. up to \$20 and 15 per cent. over \$20.

CITY ASSESSMENT.

1896	\$22,560,430
1897	\$22,832,020
1898	\$22,851,700
1899	\$23,519,520
1900	\$25,077,460
1901	\$26,405,770
1902	\$28,615,810
1903	\$36,273,400
1904	\$48,214,950
1905	\$62,727,630
1906	\$80,511,725

N.B.—These figures include the amounts for business tax. they are the figures upon which the rates are struck in each respective year.

The total Assessment of the City is \$80,511,255.

The debt to be created for the Water Power is \$3,250,000, approximately 4 per cent. of the assessment.

The Interest and Sinking Fund to be collected each year, supposing the revenue from the works to be insufficient, is \$168-488 or (.2) two tenths of 1 per cent.

If the whole works were paid for outright in cash, each \$1000 of assessment would pay \$40.

If the whole Interest and Sinking Fund were to be collected yearly, each \$1000 of Assessment would pay \$2.00.

As a matter of fact, nothing will have to be paid out of the general taxes.

The works will be self supporting and revenue earning in the same way that the water works is.

In addition to which all power and light users will pay only a fraction of what they now pay for these services.

Among the numerous large Hydro-Electric developments which are taking place all over the Continent may be mentioned that of the Mexican Light and Power Company, who are now constructing a Hydro-Electric plant and transmission line to the City of Mexico, a distance of 95 miles. The amount of power to be derived from this development will approximate 200,000 Horse Power.

The Ontario Government has appointed a commission known as the Hydro-Electric Commission for the purpose of carrying out power developments on behalf of the various Municipalities. The report is most favorable to Municipal ownership of Power in Ontario, where fuel is cheap, and conditions much more favorable to Manufacturing than in Manitoba.

The Municipal Commission, another Ontario Commission appointed by some interested Municipalities, has gone very fully into this matter, and strongly recommend Municipal ownership. This Commission gives the cost of development of power for use in Toronto and adjacent Municipalities as follows :—

30,000 H.P.	\$ 7,669,102
60,000 "	10,334,100
100,000 "	12,880,893

The proposed Winnipeg River development compares most favorably with the above figures.

ELECTRIC HEATING.

House using 100 lbs. of Coal per day at \$10.00 per ton. Assuming that one half the heat from the Coal is expended in useful heating, the heat units utilized are :—

50 lbs. at 14000 B.T.U. = 700,000 B.T.U.

700,000 x 778 foot lbs. = 544,600,000 foot lbs.

Horse Power Hours = 275

K. W. Hours = 205

Cost per day 205 x 3-16 cents. = \$0.38

100 lbs. Coal at \$10.00 per ton. = \$0.50

Saving per day..... = \$0.12

Winnipeg, Man.,
April, 30th, 1906.

Mr. Alderman J. W. Cockburn, Chairman,
and Committee on Hydro Electric Power,
Winnipeg.

Gentlemen :—

In accordance with your instructions, Surveys were made of Seven Portage Rapids & Point du Bois Falls of the Winnipeg River.

From the accompanying plans it will be seen that the location of the Power Plant of the Winnipeg Electric Railway Co. in the Pinewa or Back Channel of the Winnipeg River is 58 miles from the City of Winnipeg. It will also be observed that the water for this power is diverted from the Winnipeg River at a point above the Seven Portages Rapids, and re-enters the main River at Lac du Bonnet below the Seven Portages.

March is the month of lowest flow in the Winnipeg River. A current meter gauging at the Point du Bois Falls on the 7th. March this year gave the flow in cu. ft. per second as 19870

A gauging taken on 24th. March at Seven Portages gave the flow as.....	cu. ft. Sec.	18985
The quantity of water at the same time going through the Pinewa Channel was.....	cu. ft. measured	
at the Electric Ry. Power Works.....		450
or the total flow of the River, cu. ft. second...		19435

which checks with the gauging at Point du Bois.

The drainage area of the Winnipeg River above Point du Bois is approximately 57,000 square miles. The low water flow of the River is therefore .3 cubic feet per second per sq. mile of drainage area. Several large Lakes on the water shed, notably Rainy Lake and the Lake of the Woods act as storage reservoirs, and account for the fact that the run off at extreme low water is larger than would have been expected.

It is stated that the Electric Railway Generating Plant on the Pinewa will use water at the rate of 8,000 to 10,000 cu. ft. per second. So that only 9,000 to 11,000 cu. ft. per second would be available for power purposes at the Seven Portages.

There is no sufficient data from which to estimate the High Water Flow of the River, and in view of the fact that the Low Water Flow is more than sufficient for present requirements, the High Water Flow is not a matter of immediate importance.

Ample provision should be made in constructing a power dam, for the passage of any possible flood water, and in future, if necessary, for increasing the pondage to meet larger demands for Power. Provisions may be made for increasing the low water flow by storage at convenient points up River. The power dam at Keewatin already has a considerable influence in this respect.

The available heads of water at the sites referred to are :—

Seven Portages... .. 30 ft.
Point du Bois... .. 45 to 48 ft.

If found advisable in the future, the Fall at Point du Bois can be increased some 3 to 5 feet by the removal of a ledge of rock which now obstructs the Channel below the Falls. It is not considered necessary or desirable, however, to incur any expenditure in this direction at present.

The estimated lengths of transmission lines are as follows:

Winnipeg to Seven Portages..... 55 miles
Winnipeg to Point du Bois... .. 75 miles

	Water Cubic Feet per Second.	Head Feet	Approximate Hydraulic Horse Power	Approximate Horse Power Low Tension Bus-bars at Power-House	Approximate Horse Power Low Tension Bus-bars Sub Station Win- nipeg Ready for Distribu- tion.
*Seven Portages	**11000	32	39000	28000	24000
Point Du Bois	19000	48	104,000	75000	65000

* The 3 upper falls only are here taken into account.

** After deducting a probable 8000 cu. ft. per second to be diverted by the Winnipeg Electric Ry. Company.

In accordance with your instructions the above data together with the plans and detailed information were submitted to a committee of Engineers composed of Cecil B. Smith, Wm. Kennedy, Jr., and the undersigned, who spent several days in a careful study of the whole subject, and whose report is submitted herewith—

It will be remembered that last fall, 1905, an examination of the Winnipeg River was made by Mr. Smith under instructions from your Committee, and that preliminary reports were made by him on the general characteristics of the several water power sites from White Mud to Point du Bois. These reports are on file and need not be further referred to here.

The following is a short description of the Works which it is proposed to construct.

The dam from the left bank across the deep water to the Island will be of Rockfill. From the Rockfill dam across the island and along the left bank of the Canal, the dam will be of concrete, intended for the greater part of its length to form the overfall for the surplus flow of the River.

The canal will be fifteen feet in depth by two hundred feet in width, partly in rock cutting and partly in embankment.

The Power House situated at the lower end of the canal will, for the complete development, be about 500 ft. in length by 100 ft. in width, and with the foundations, flumes and draft tubes, will be constructed of concrete. The transformer house will be a separate building from the power house, and will also be of concrete.

The Sub Station in Winnipeg is also intended to be of fire-proof construction.

The transmission line has been estimated on the basis of two independent steel tower lines, in order to avoid the danger and inconvenience of having all lines on one set of towers. A Right-of-way of 100 ft. in width, including 40 miles of double fencing has been provided for.

The transmission line estimates also include the cost of a complete telephone installation.

A tramway from near the present terminus of the Lac du Bonnet Railway of Canadian Pacific, along the route of the transmission to Point du Bois has been estimated on. It is believed that the tramway will cost less in the end than would a corduroy road and its maintenance. The tramway will be permanently useful for Patrol purposes.

It will be observed that the costs of power delivered in Winnipeg are the net costs at the substations, and that the cost of distribution say \$5.00 per H.P. must be added to give the net cost delivered to the consumer.

To these must be added the sinking fund (the term and amount of which are yet to be decided upon) and a percentage to cover contingencies, so that the revenue would be such as to undoubtedly carry the works without the possibility of a deficit.

(Signed) H. N. RUTTAN,
City Engineer.

CONSULTING ENGINEER'S REPORT.

REPORT ON PROPOSED GENERATION OF ELECTRICAL ENERGY FROM WATER-POWER ON THE WINNIPEG RIVER, AND TRANSMISSION OF ELECTRICAL ENERGY GENERATED TO THE CITY OF WINNIPEG.

The following report and estimates of costs are based on surveys, plans, gaugings and soundings made by the City Engineer's Department of Winnipeg.

The low water flow of the Winnipeg River may, by gaugings taken, and comparing with the drainage area tributary in the Province of Ontario and State of Minnesota, be taken at 19,000 cubic feet of water per second; but certainly at not less than 17,000 cubic feet per second, and this latter quantity of water will produce on switchboard 1420 effective electrical horse-power for each one-foot fall.

Two sites for water-power development were surveyed;—(a) one at Seven Portages Rapids and (b) one at Point du Bois (or 30-foot) Falls.

(a) **Seven Portages Rapids.** The upper portion of these rapids affords a reasonably satisfactory site at a point fifty-five miles distant from Winnipeg, but it has the vital drawback that, owing to the location of the inlet to the Winnipeg Electric Railway Company's power development several miles up the river from this site, a large portion of the flow of the river will doubtless in time be abstracted from the river and not returned again except by way of Lac du Bonnet—miles below this site. It is estimated that not more than 9,000 cubic feet per second can be counted on in low water as remaining, and available for power at Seven Portages, and this quantity used under approximately 30 feet head would give a net output on switchboard of 21,500 horse-power, delivering about 18,000 horse-power in Winnipeg. Looking to the future requirements for Winnipeg this does not appear to be a large enough development to fix upon for an ultimate source of power, particularly in view of the favourable site about to be described.

(b) **Point du Bois Falls.** This location, seventy-five miles from Winnipeg, has a natural fall of 32 feet, and it is proposed by damming to raise the water some 13 feet higher, which, if necessary, can be further increased in dry weather to 14 or 15 feet; but taking even a 45-foot head or total fall and using 17,000 c.f.s. as low water flow, a total development of 63,900 H.P.

can be counted upon for 24 hours per day. Owing to there being seven square miles of reservoir area above this point a very much greater amount of power could be generated for the heavy load period of each day, up, to a total of say 100,000 H.P. for several hours, allowing the reservoir to recover during each night, when the power demands are below normal.

As regards ice the location is very satisfactory, as, although the construction of the dam to the level proposed will not flood much additional land owing to the present banks being precipitous, yet it will practically drown out Lamprey Falls and other smaller rapids above Lamprey Falls, and will thus largely prevent the formation of frazil ice.

The construction of the proposed works does not present any novel engineering problems or difficulties. It is proposed to build a canal 1500 feet long, partially by excavation through solid rock and partially by concrete side walls, creating over-flow dams having 1800 lineal feet of crest, thus avoiding any danger from high water and avoiding operating expenses attendant on the use of stop-logs for controlling head-water level.

The transportation problem is to be met by building a cheap tramway from Lac du Bonnet, opposite the railway station of the same name; and by maintaining this tramway, not only during construction, but continuously afterwards in order to facilitate and make more effective, the patrol of the transmission lines adjacent thereto.

The immediate development proposed is for the delivery in Winnipeg of 17,000 H.P. of electrical energy, stepped down ready for distribution on the low-tension bus-bars, together with such transmission lines and hydraulic and electric generating station expenditures as are necessary for safety of operation and for expansion of plant from time to time as the demand for power increases.

Additional estimates are given showing the amounts necessary to be expended to deliver 34,000 or 50,000 H.P. in Winnipeg under similar conditions as regards spare capacity to insure continuity of service as in the case of the present proposed development.

In order to show not only what capital expenditure will be necessary but what it will cost to operate and maintain the proposed works, an estimate is also given of yearly operation under the three proposed stages of development. This estimate includes interest at 4½ per cent. repairs, renewals, operation and administration, but not sinking fund. It will be noticed that the cost of delivered power varies sharply with the amount sold owing to the heavy first investment common to all estimates, and higher proportional operating charges for the smaller plants.

The cost of 10-hour power, etc., in the City of Winnipeg, distributed from sub-station provided for in the accompanying estimates will depend on such features as: the class of loads, the amount of 24-hour power used, the pumping arrangements, and the extent of the lighting loads, limited hour contracts, etc. Speaking generally: the cost of distributing will add \$4.00 to \$6.00 per H.P. per year to the cost of the power at the sub-station.

It may be pointed out, however, that under skilful arrangement of loads surplus power can be offered at certain hours at very low rates and also that in most situations by a subdivision of motors on the various machines and floors of manufacturing establishments the total amount of electric power used will be from 25 per cent. to 50 per cent. less than the rated capacity of the engines and boilers used for the same services.

Owing to the high price of fuel in Winnipeg, the cost of the present power in use is doubtless excessive, and any private distributing companies operating without restriction (as under present conditions) will not materially reduce these prices by the sale of water-generated electric power.

In order to supply an unlimited demand for cheap power, to lessen the cost of power to present users, and to encourage the establishment of new industries, the City will, in our opinion, be fully justified in undertaking the construction of the Point du Bois water-power, which we consider would be a first-class development and which undoubtedly ranks equal or superior to any other site for power development on the Winnipeg River.

(Signed) { CECIL B. SMITH.
WM. KENNEDY, Jr.
H. N. RUTTAN.

Toronto, Ont.,

25th. April, 1906.

**BASIS OF ESTIMATES FOR HYDRO-ELECTRIC
DEVELOPMENT AT POINT DU BOIS FALLS
ON WINNIPEG RIVER, AND TRANSMIS-
SION OF POWER TO THE CITY OF
WINNIPEG.**

Items.	1st Development.	2nd Development.	3rd Development	Remarks.
Dam, head-Works, canal and power house excavations.	60,000 h.p.	60,000 h..p	60,000 h.p.	net power on switch board

Items.	H			Remarks.
	1st Development.	2nd Development.	3rd Development	
Power-house Hydraulic and electric power-house machinery.	30,000 h.p.	45,000 h.p.	60,000 h.p.	
Transformer station.	25,000 h.p.	45,000 h.p.	65,000 h.p.	3 separate unit in each case.
Transmission lines.	20,000 h.p.	40,000 h.p.	60,000 h.p.	Net input.
Steel towers for lines	25,000 h.p.	37,500 h.p.	50,000 h.p.	Power delivered in Winnipeg.
Sub-station in Winnipeg	1 double	2 double	2 double	
	17,000 h.p.	34,000 h.p.	50,000 h.p.	Net output.
Right of way :—100 ft. wide for 70 miles ; 66 ft. wide for 5 miles.				
Fencing :—40 miles, both sides				
Telephone system :—separate poles over whole distance.				
Tramway :—Standard gauge ; 20 miles from Lac du Bonnet to power-house.				
Dry weather flow :—19,000 cubic feet per second.				
Effective head estimated on :—45 feet.				
Effective flow estimated on :—17,000 cu. ft. per sec.				
Storage area :—7 square miles of lake.				

ESTIMATE OF CAPITAL EXPENDITURE FOR HYDRO-ELECTRIC DEVELOPMENT AT POINT DU BOIS FALLS ON WINNIPEG RIVER; AND TRANSMISSION OF POWER TO THE CITY OF WINNIPEG.

Items.	17,000 H.P. Delivered.	34,000 H.P. Delivered.	50,000 H.P. Delivered.
Dams, including overflow and cut-off...	\$205,000	\$205,000	\$205,000
Canal headworks.	25,000	25,000	25,000
Canal	157,500	157,500	157,500
Excavation for power-house (including cofferdams)	90,000	90,000	90,000
Wheel-pits	100,000	150,000	200,000
Power-house building, including cranes	175,000	250,000	350,000
Hydraulic and electric machinery, and low tension switchboard	500,000	900,000	1,300,000
Transformer Station.....	250,000	500,000	750,000
Transmission lines, 75 miles.....	630,000	970,000	1,160,000
Sub-station	215,000	430,000	645,000
Tramway, 20 miles.....	200,000	200,000	200,000
Totals	\$2,547,500	\$3,877,500	\$5,082,500
Engineering, 5 per cent. additional.....	127,375	193,875	254,125
Contingencies, 10 per cent. additional..	254,750	387,750	508,250
	\$2,929,625	\$4,459,125	\$5,844,875

Interest during construction, additional (5 per cent. for 2½ years on average expenditure).....	183,101	278, 95	365,305
Total Investment	\$3,112,726	\$4,737,820	\$6,210,180
Capital cost per horse-power delivered at sub station switchboard ready for distribution.....	\$183	\$139	\$124
Sub-divided as follows:			
(a) Generating plant	* 118	* 86	2
(b) Transmission system, including transformer stations	65	53	52

* These items include expenditure chargeable to future extension, for instance: the canal, dam, power-house excavation, are charged in full.

(Signed) { CECIL B. SMITH.
WM. KENNEDY, Jr.
H. N. RUTTAN.

YEARLY CAPITAL AND OPERATING CHARGES ON HYDRO-ELECTRIC DEVELOPMENT AT POINT DU BOIS FALLS AND TRANSMISSION LINES TO WINNIPEG.

Items.	17,000 H.P. Delivered.	34,000 H.P. Delivered.	50,000 H.P. Delivered
Interest, 4½ per cent. on capital	\$140,072	\$213,202	\$279,458
Operating charges and repairs on trans- mission line	24,999	40,146	47,045
Operation and repairs, sub-station.....	24,035	45,770	67,405
Operation and repairs, transformer station	26,500	51,500	76,500
Operation and repairs, power house...	70,446	95,908	122,584
General administration and patrol	20,000	25,000	30,000
	\$306,052	\$471,526	\$622,992
Cost of 24-hour power per H.P. per year at sub-station low tension bus-bars, ready for distribution.....	\$18	\$13.87	\$12.46

(Signed) { CECIL B. SMITH.
WM. KENNEDY, Jr.
H. N. RUTTAN.

Toronto, Ont.,
25th. April, 1906.

BY-LAW No. 4138.

A By-law of the City of Winnipeg to create a debt of Three millions, two hundred and fifty thousand dollars (\$3,250,000.00) and for the issue to that amount of Power Debentures of the City.

WHEREAS it is deemed expedient and desirable to contract a debt of the City of Winnipeg for the sum of Three millions two hundred and fifty thousand dollars (\$3,250,000.00) and to issue debentures of the City to be known as "Power Debentures" to that amount to represent the said debt for the purpose of acquiring sites, rights of way and other necessary property building and maintaining a tramway in connection with the power plant, and for constructing power plant for producing, manufacturing, transmitting, conducting, supplying and distributing electricity for heat and power purposes of every description, and for any uses to which electricity may be put by the City under any authority which is now conferred or may hereafter be conferred on the City by the Legislature, and for distribution and sale of same for commercial use in the City of Winnipeg and for electric street lighting and the lighting of civic buildings and public places;

AND WHEREAS the proposed site for the installation of such water power plant is at or near Point du Bois on the Winnipeg River, or such other place or places on the Winnipeg River as the Council may select in the Province of Manitoba;

AND WHEREAS it is intended to issue debentures by the sale of which to realize the moneys necessary for the said purposes making the said debentures extend over a period of forty years from the issue of same;

AND WHEREAS the total amount required to be raised annually by special rate for paying the new debt and the interest thereon (the latter being computed at four per centum per annum) and for the Sinking Fund for the former interest being computed on the re-investment thereof at the rate of three and one half per centum per annum during said period of years beginning with the year one thousand nine hundred and seven and ending with the year one thousand nine hundred and forty-six (1946) is One hundred and sixty-eight thousand, four hundred and thirty-eight dollars (\$168,438.00), the interest being One hundred and thirty thousand dollars (\$130,000.00) and the levy for sinking fund Thirty-eight thousand four hundred and thirty-eight dollars (\$38,438.00);

AND WHEREAS there is reason to believe that after the completion of the said works the revenue from the same will enable the City to dispense wholly or largely with the levy referred to in the preceding recital ;

AND WHEREAS the amount of the whole rateable property in the City of Winnipeg according to the last revised assessment roll of the said City (namely, the assessment roll of the year 1905) is Sixty-two millions, seven hundred and twenty-seven thousand, six hundred and thirty dollars (\$62,727,630.00);

AND WHEREAS the amount of the existing debenture debts of the City of Winnipeg exclusive of local improvement debts secured by special acts, rates or assessments (but including the debts for waterworks and electric lighting is Five millions seven hundred and twelve thousand, six hundred and seventeen dollars and seventy-two cents (\$5,712,617.72) ;

NOW THEREFORE the Municipal Council of the City of Winnipeg in Council assembled enacts as follows :—

1. This By-law shall come into force and take effect on the fifteenth day of August A.D. 1906.
2. A debt is hereby created and intended to be created for purposes aforesaid in and for the sum of Three millions two hundred and fifty thousand dollars (\$3,250,000.00) and the same shall be payable in forty years from the fifteenth day of August A.D. 1906, namely, the fifteenth day of August A.D. 1946.
3. Three thousand two hundred and fifty (3250) debentures of the City of Winnipeg, each for the sum of One thousand dollars (\$1000.00) shall be duly prepared, executed and sold for the purpose aforesaid ;
4. The said debentures shall be deemed to have been properly executed by being signed by the Mayor, Treasurer and Comptroller of the City of Winnipeg and sealed with its corporate seal.
5. Eighty coupons shall be attached to each of the said debentures and each coupon shall be for the sum of Twenty dollars (\$20.00) the said sum being interest at four per centum per annum upon each debenture for a period of one half year, one coupon being made payable each six months after the date of said debentures.
6. The said coupons shall be deemed to have been properly executed by each one having printed or lithographed thereon the names of the Mayor and Treasurer and the same shall be countersigned by the Comptroller writing his initials thereon. Each coupon shall be numbered with the number of the debenture to which it is attached.

7. Each debenture shall bear date the fifteenth day of August A.D. 1906 (being the date on which this By-law takes effect as aforesaid) and shall contain a promise to pay the principal of the said debenture and also the interest thereon at the said rate of four per centum per annum, which payment of interest shall be made by the payment of the respective coupon attached to the debenture.

8. The said debentures shall be made payable at the Canadian Bank of Commerce, City of Winnipeg. The amount of the said coupons, namely, the said interest, shall be payable at any of the chief agencies of the said Canadian Bank of Commerce in the following cities:—London (England), New York, Montreal, Toronto and Winnipeg, and each coupon payable at the City of London aforesaid may be paid in sterling exchange, namely, four pounds, two shillings and two pence instead of Twenty dollars (\$20.00).

9. There shall be raised annually during each of the forty years beginning with the year 1907 and ending with the year 1946 by special rate sufficient therefor on all the rateable property in the City of Winnipeg the sum of One hundred and thirty thousand dollars (\$130,000.00) to provide for the payment of interest on the said sum of Three million two hundred and fifty thousand dollars (\$3,250,000.00) during the currency of the said debentures.

10. There shall be raised annually during each of the forty years beginning with the year 1907 and ending with the year 1946 by special rate sufficient therefor upon all the rateable property in the City of Winnipeg the sum of Thirty-eight thousand four hundred and thirty-eight dollars (\$38,438.00) to provide for the payment of the debt, interest being estimated on the investments of such annual sums at the rate of three and one half per centum per annum.

11. The total of the said two sums for the payment of the interest and for the payment of the debt referred to in the two immediately preceding clauses of this by-law being the aggregate sum of One hundred and sixty-eight thousand four hundred and thirty-eight dollars (\$168,438.00) to the extent hereinafter mentioned shall be raised and levied in each year by a special rate sufficient therefor on all the rateable property in the City of Winnipeg as provided for said sums respectively in the two immediately preceding clauses hereof, but notwithstanding the provisions of this and the two preceding clauses of this By-law only so much of the said sums may be levied in any year on the rateable property of the City as shall be necessary to make up the deficiency of the preceding fiscal year (with interest thereon until the next year's levy is made) by reason of the revenues of the plant and works being insufficient to pay the said interest and sinking fund in addition to operating expenses and repairs.

12. This By-law shall be submitted to the electors duly qualified to vote thereon on the 28 day of June A.D. 1906; and for the purpose of taking the votes thereon the polls shall be opened at and remain open from the hour of nine o'clock in the forenoon till the hour of eight o'clock in the afternoon of the said day in each of the following places in the City of Winnipeg, and at each of the said places the following persons shall be the respective deputy returning officers to take the votes of the electors upon the By-law, namely :—

- Polling Subdivision No. 1.....28 Main Street.
 Polling Subdivision No. 2.....Fire Hall, 4 Gertrude Avenue.
 Polling Subdivision No. 3.....311 Main Street.
 Polling Subdivision No. 4.....South Fire Hall, corner York Avenue and Smith Street.
 Polling Subdivision No. 5.....N. E. Cor. Kennedy and Portage Avenue.
 Polling Subdivision No. 6.....346 Notre Dame Avenue.
 Polling Subdivision No. 7.....980 Portage Avenue.
 Polling Subdivision No. 8.....676 Sargent Avenue.
 Polling Subdivision No. 9.....316 McGee Street.
 Polling Subdivision No. 10.....20 Knappen Street.
 Polling Subdivision No. 11.....Fire Hall, Sherbrooke Street.
 Polling Subdivision No. 12.....582 Young Street.
 Polling Subdivision No. 13.....141 Langside Street.
 Polling Subdivision No. 14.....104 Lombard Street.
 Polling Subdivision No. 15.....180 Market Street East.
 Polling Subdivision No. 16.....Central Fire Hall.
 Polling Subdivision No. 17.....Civic Offices.
 Polling Subdivision No. 18.....93 Harriet Street.
 Polling Subdivision No. 19.....483 Ross Street.
 Polling Subdivision No. 20.....Fire Hall, corner McDermot & Pearl Streets.
 Polling Subdivision No. 21.....Fire Hall, Maple Street.
 Polling Subdivision No. 22.....90 Disraeli Street.
 Polling Subdivision No. 23.....Corner Logan and Princess Streets.
 Polling Subdivision No. 24.....714 Logan Avenue.
 Polling Subdivision No. 25.....223 Dufferin Avenue.
 Polling Subdivision No. 26.....412 Dufferin Avenue.
 Polling Subdivision No. 27.....233 Pritchard.
 Polling Subdivision No. 28.....Fire Hall, corner Burrows and Albion Streets.
 Polling Subdivision No. 29.....277 Mountain Avenue.
 Polling Subdivision No. 30.....229 Atlantic Avenue.
 Polling Subdivision No. 31.....Woodmen's Hall.
 A-L
 Polling Subdivision No. 32.....Woodmen's Hall.
 M-Z

13. On the 27th day of June A.D. 1906, at the hour of four o'clock in the afternoon the Mayor of the City of Winnipeg shall attend at his office in the City Hall for the purpose of appointing persons to attend at the various polling places and also to attend the official summing up of votes hereinbefore referred to by the City Clerk on behalf of the persons interested in this By-law and promoting or opposing the passage of this By-law respectively.

14. And on the 3rd day of July A.D. 1906 at his office in the City Hall in the City of Winnipeg at the hour of three o'clock in the afternoon the City Clerk of the City of Winnipeg shall sum up the number of votes given for and against this By-law.

DONE AND PASSED in Council assembled this day of
A.D. 1906.

MAYOR.

Certified Correct,

CITY CLERK.

City Solicitor.